U.S. Department of Transportation

Federal Aviation Administration

Memorandum

Subject:	Action: Review and Concurrence, Equivalent Level of Safety Finding for Indication of Unlocked Flightdeck Door	Date:	January 2, 2003
	FAA Project Numbers ST6862SE-T	Reg Ref:	§25.1309(c)
From:	Manager, TSS Airplane & Flight Crew Interface Branch, ANM-111	Reply to Attn of:	Shannon Lennon Airframe, ANM-120S
To:	Manager, Seattle Aircraft Certification Office, ANM-100S	ELOS Memo #:	ST6862SE-T-S-1

Background

TTF Aerospace, LLC has applied for Supplemental Type Certificates (STC) to install strengthened cockpit door designs on DHC-8-100, DHC-8-200, and DHC-8-300 model airplanes to support the part 121 retrofit rule adopted at amendment 121-288. TTF Aerospace designs do not incorporate any hardware indication in the pilot's normal view for the flightdeck door lock/unlock status.

Since September 11, 2001, an unlocked flightdeck door has been considered a potentially hazardous condition. This is a different characterization than existed prior to September 11, but one that is both appropriate and applicable, given the potential consequences of an unlocked flightdeck door.

During flight, it is expected that the door may be opened for various reasons (e.g., pilot use of restroom or meal/refreshment service for the flightcrew). For the designs that incorporate a manual locking/unlocking mechanism, it is considered likely that the door will be closed in many cases by persons other than the pilots (e.g., cabin crew or observers' seat occupant). In such situations, that person may be unable to lock the door or may fail to lock the door. Pilots, who may be occupied with other tasks, may fail to ensure that the door is locked. Therefore, flightdeck door designs should include features that will reduce the likelihood of this foreseeable crew error, which would result in unrestricted access to the flight deck.

Applicable regulation(s)

Section 14 CFR 25.1309(c) requires that, "Systems, controls, and associated monitoring and warning means must be designed to minimize crew errors which could create additional hazards." The door locking mechanism is a system (whether mechanical or electro-mechanical) under the terms of § 25.1309(c) and, as noted above, a door that is unlocked creates an additional hazard.

Regulation(s) requiring an ELOS

Section 14 CFR 25.1309(c)

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)
TTF Aerospace, LLC will add the following procedures in the Operating Limitations section of the Aircraft Flight Manual (AFM) supplement. The limitations will include the following:

> The flight deck door must be kept closed and locked at all times during flight except to permit access and egress in accordance with the FAA approved procedures for opening, closing and locking the door.
>
> Any time the cockpit door is opened in flight, a challenge and response closing and locking verification procedure must be used to verify that the door is closed and locked.

The DHC-8-100, DHC-8-200, and DHC-8-300 model airplanes have average flight segments of less than two hours.

Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation
The above operational procedures, including the challenge and response procedure, reduce the likelihood of crew error in leaving a flightdeck door unlocked.

In addition, the FAA considers the DHC-8-100, DHC-8-200, and DHC-8-300 model airplanes to have average flight segments of less than two hours. On these shorter flight segments pilots should not need to open the flightdeck door as frequently, reducing the chance of the door being closed and unlocked. The FAA considers this a compensating feature in the design.

Note, this approach would not be acceptable for any warning associated with a cockpit control (reference § 25.777).

FAA approval and documentation of the ELOS
The FAA has approved the aforementioned Equivalent Level of Safety Finding in issue paper S-1. This memorandum provides standardized documentation of the ELOS that is non-proprietary and can be made available to the public. The Transport Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number should be listed in the Type Certificate Data Sheet under the Certification Basis section (TC's & ATC's) or in the limitations and conditions section of the STC Certificate. [E.g. Equivalent Safety Findings have been made for the following regulation(s): §25.1309(c) Indication of Unlocked Flightdeck Door (documented in TAD ELOS Memo ST6862SE-T-S-1)]

Original Signed by

Don Stimson January 2, 2003

Manager, Airplane & Flight Crew Interface Branch, ANM-111 Date

ELOS Originated by Seattle ACO:	Name Shannon Lennon	Routing Symbol ANM-120S